

## CLAIMS

1. A multi-carrier transmission system for transmitting information signals over a set of carriers, the set of carriers comprising a sub-set of carriers, denoted sub-carriers, each sub-carrier being modulated according to a first modulation comprising complex symbols, the real parts of which being proportional to a combination of the real parts of complex symbols of a second constellation, which convey additional information signals, with the real parts of complex symbols of a third constellation, which convey parameter signaling signals, the complex parts of the symbols of the first modulation being proportional to a combination of the complex parts of the symbols of the second constellation.
2. A system as claimed in claim 1, wherein said third modulation is of the type DBPSK and wherein couple of symbols of the second constellation makes an angle, which is smaller than 90 degrees.
3. A system as claimed in claim 2, wherein said sub-carriers are the DBPSK modulated TPS carriers of the DVB-T transmission system.
4. A system as claimed in claim 3, wherein the complex symbols, denoted  $z$ , of said second constellation are defined by  $z \in \{1+j.0, 5, 1-j.0, 5\}$  or  $z \in \{3+j.0, 2-j, 2+j, 1+j.0\}$  or  $z \in \{7+j.0, 6-j, 6+j, 5+j.0, 4-j.3, 5-j.2, 3-j.2, 4-j, 4+j.3, 3+j.2, 5+j.2, 4+j, 1+j.0, 2+j, 2-j, 3+j\}$ .
5. A system as claimed in claim 1, wherein the indexes of the sub-carriers in the sub-set of carriers vary with time.
6. A multi-carrier transmission device for transmitting information signals over a set of carriers, the set of carriers comprising a sub-set of carriers, denoted sub-carriers, each sub-carrier being modulated according to a first modulation comprising complex symbols, the real parts of which being proportional to a combination of the real parts of complex symbols of a second constellation, which convey additional information signals, with the real parts of complex symbols of a third constellation, which convey parameter signaling signals, the complex parts of the symbols of the first modulation being proportional to a combination of the complex parts of the symbols of the second constellation.
7. A multi-carrier reception device for receiving information signals over a set of carriers,

the set of carriers comprising a sub-set of carriers, denoted sub-carriers, each sub-carrier being modulated according to a first modulation comprising complex symbols, the real parts of which being proportional to a combination of the real parts of complex symbols of a second constellation, which convey additional information signals, with the real parts of complex symbols of a third constellation, which convey parameter signaling signals, the complex parts of the symbols of the first modulation being proportional to a combination of the complex parts of the symbols of the second constellation.

8. A multi-carrier transmission method for transmitting information signals over a set of carriers, the set of carriers comprising a sub-set of carriers, denoted sub-carriers, the method comprising the step of modulating each sub-carrier according to a first modulation comprising complex symbols, the real parts of which being proportional to a combination of the real parts of complex symbols of a second constellation, which convey additional information signals, with the real parts of complex symbols of a third constellation, which convey parameter signaling signals, the complex parts of the symbols of the first modulation being proportional to a combination of the complex parts of the symbols of the second constellation.

9. A multi-carrier transmission signal for transmitting information bits over a set of carriers, the set of carriers comprising a sub-set of carriers, denoted sub-carriers, the method comprising the step of modulating each sub-carrier according to a first modulation comprising complex symbols, the real parts of which being proportional to a combination of the real parts of complex symbols of a second constellation, which convey additional information signals, with the real parts of complex symbols of a third constellation, which convey parameter signaling signals, the complex parts of the symbols of the first modulation being proportional to a combination of the complex parts of the symbols of the second constellation.

10. A computer program product for a device computing a set of instructions, which when loaded into the device, causes said device to carry out the method as claimed in claim 8.